

# Information Systems

I- 1

INPUT

Notes



# Fundamental Driving Forces

## *Key Business Trends:*

- Shorter product life cycles
- More customization/specialization
- Narrower market segments
- Higher impact of technology
- More competition from overseas vendors

I- 2

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Notes



## Fundamental Driving Forces

- *Apply to the information systems and services industry*
- *Are restructuring the role of IS management*
  - Reactive to proactive
  - Technology-driven to user-driven
  - Centralized to "federated"

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I- 3

Notes



## Blocking Factors

- Infrastructure gridlock
- Lack of qualified in-house personnel
- Existing applications portfolio
- Organizational response time

*Create opportunities for the information services industry*

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I- 4

Notes





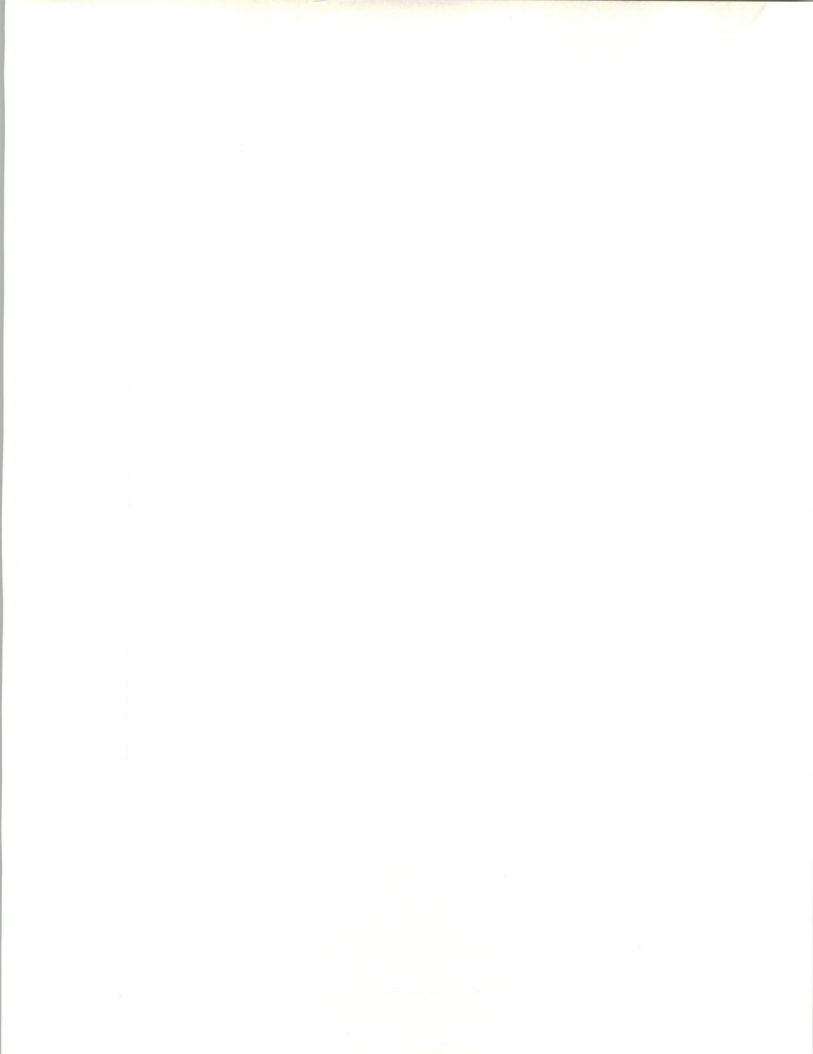
# Strategic Values

- Information
- Information systems (IS)
- Information technology (IT)

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I- 5

Notes



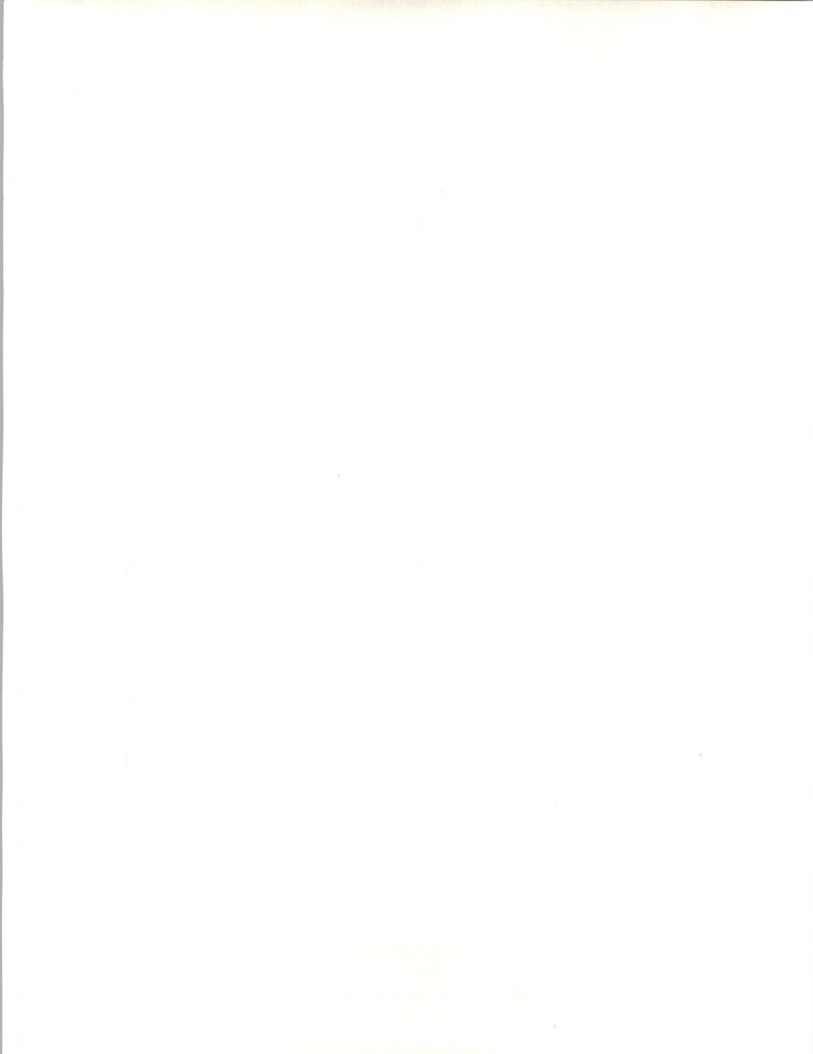
# Information Systems Major Issues

- Rising management expectations
- Demands for increasingly complex solutions
- Managing the technology investment
- Integration of data/technology/applications
- Delivery of "mission-critical" systems

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I- 6

Notes



## Information Systems Driving Forces

1. Bottom line return
2. Rapid response and deployment
3. Expanding wealth of technology
4. International competition
5. Unstable organizational environments
6. Integration

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Notes



# Where's the Productivity?

I- 8

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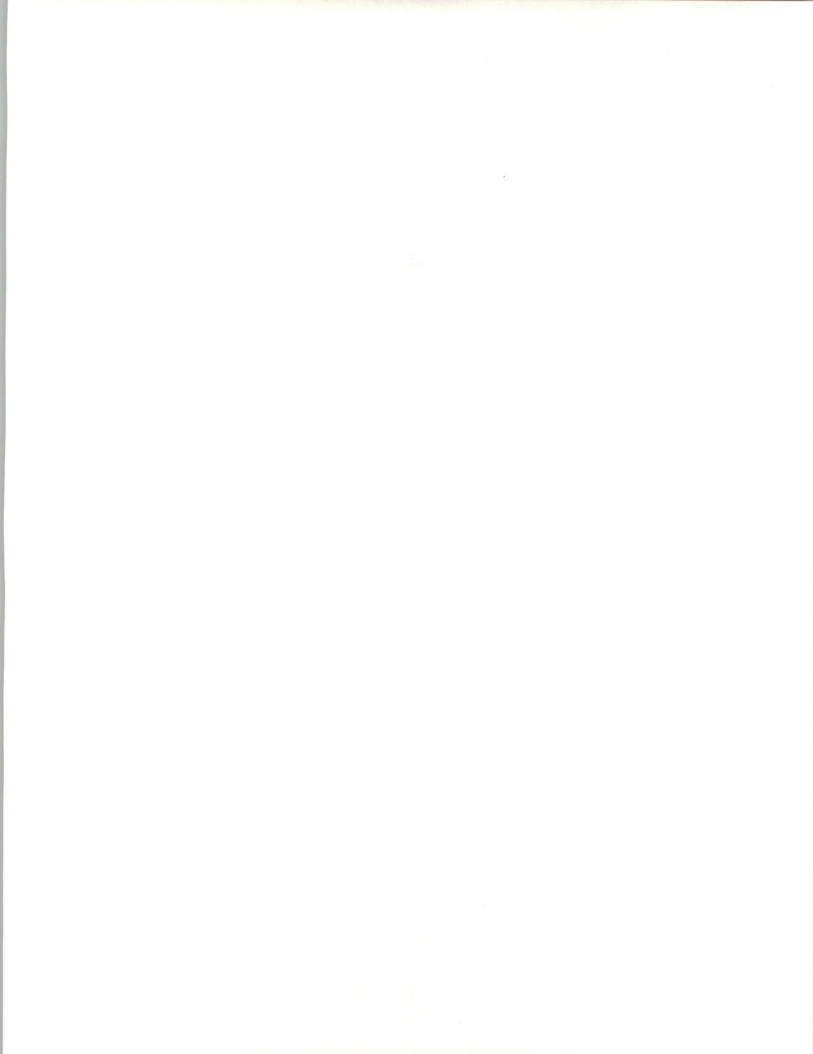
## IS Trends

- IS to reduce costs
- IS for competitive advantage
- Mission-critical systems
- Inter-enterprise systems
- Integrated customer-oriented systems

I- 9

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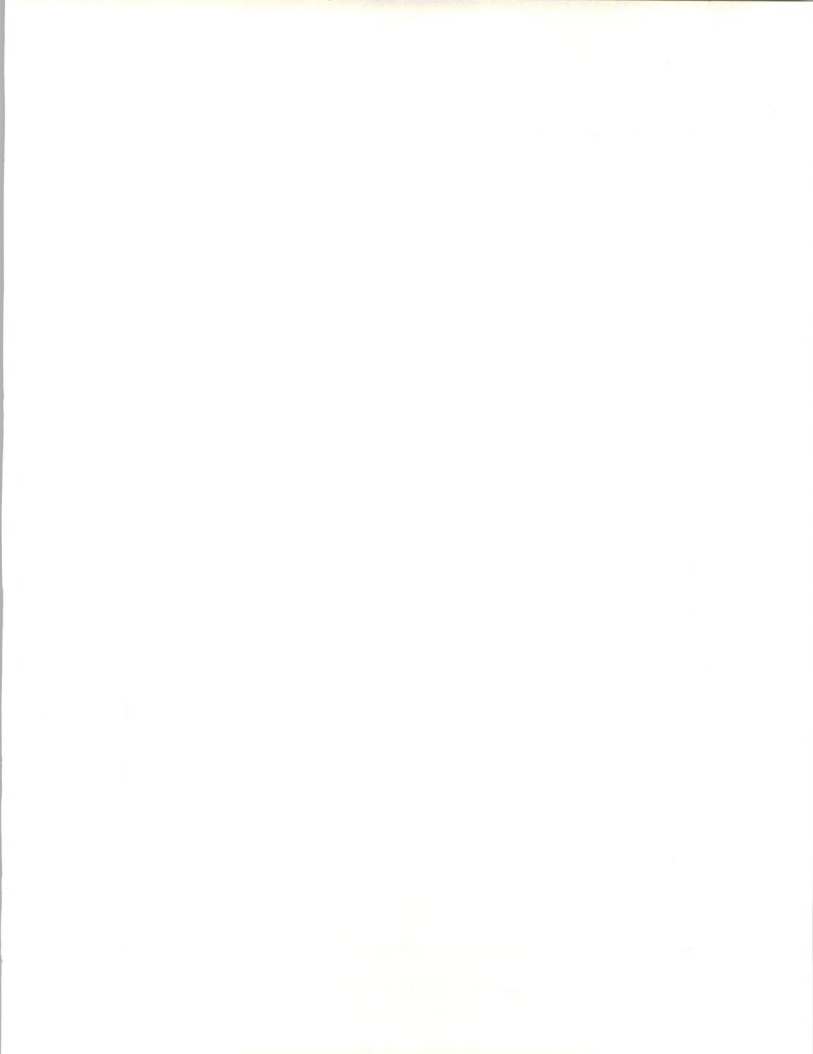
# IS Issues

- Reporting structure
- Scope of responsibility
- Budgetary authority
- Senior management people expectations

I- 10

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# Make vs. Buy

I- 11

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## Development

- Where performed?
- By whom?

I-12

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Notes





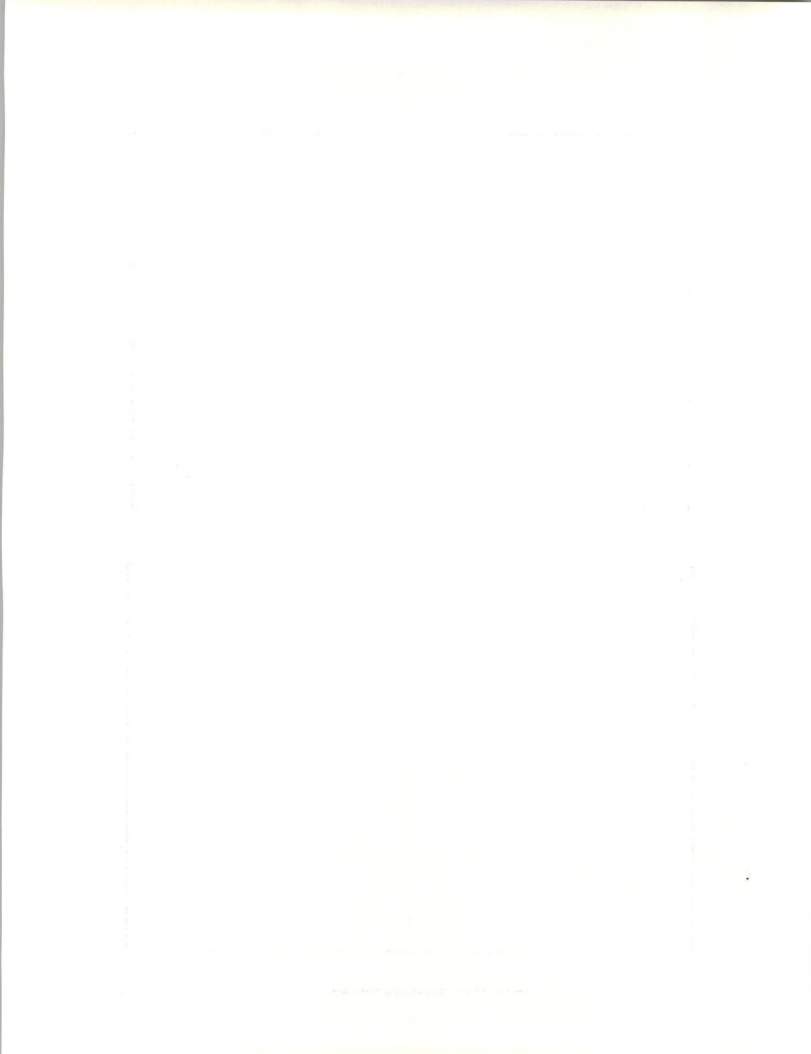
# Telecommunications

- Responsibility?
- Integration?

I-13

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Notes



## Other Issues

- Education and training
- Standards and policies

I-14

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Notes



## Internal IS Considerations

- Who owns the data?
- Who gets benefit from its use?
- Is information an "asset"? Or is it free?

I-15

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Notes



# Information Systems Priorities

- Clear expectations of IS
- Identify mission-critical processes
- Application development—use all alternatives

I-16

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# Information Systems Priorities

- Data management—company-wide orientation
- Technology architecture—network management
- Central IS—consulting role

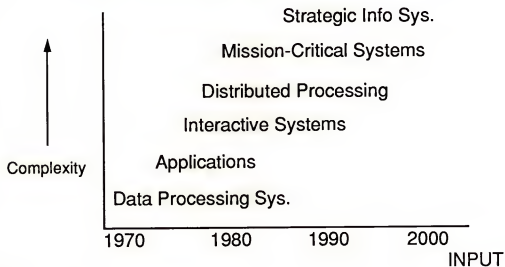
I-17

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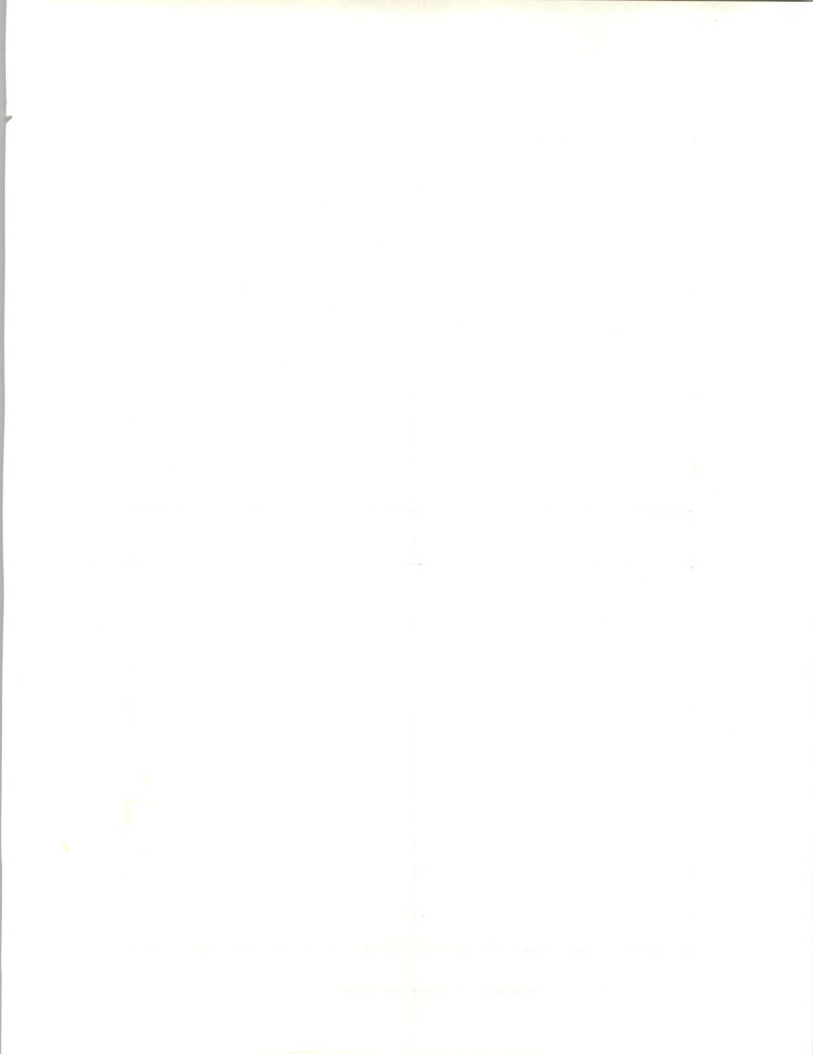


## Complexity of the Requirement

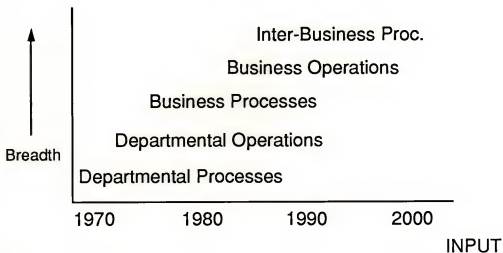


I-18

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## Breadth of the Relationship



I- 19

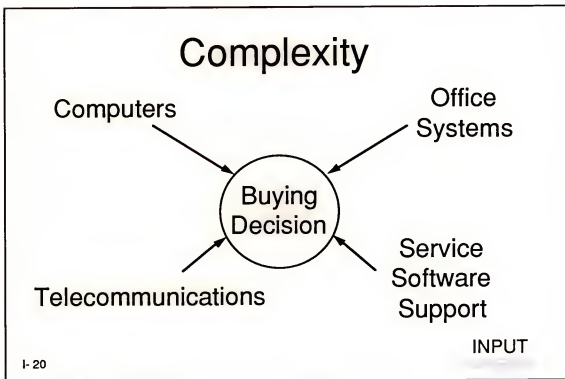
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# Law 1

Rate of supply >  
rate of absorption

I-21

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## Limits to Growth

- Absorption rate
  - Implementation
  - Education and training
  - Organization changes
  - Resistance to change
  - Logistics

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Notes



# Buying Process Changing

- Involves
  - Users
  - IS management
  - Finance
  - Corporate management
- More specialists

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Notes



# Technology is a Mixed Blessing

- Technology adds complexity
- Poor application is counter-productive
- Change process with systems

I- 24

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Notes





## Ranking of Key Technology Trends

1. Integrated data bases (relational)
2. Platform independence/systems connectivity
3. CASE technologies
4. Expert systems
5. On-line transaction processing

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Notes



# Ranking of Impact of New Technologies

1. Image processing
2. Voice recognition
3. Natural language processing
4. Self-teaching expert systems

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Notes



# Technology Trends

- Not a driving force
- Evolutionary vs. revolutionary
- Three phases of technology application
  - Comparative advantage
  - Comparative parity
  - Comparative necessity

I-27

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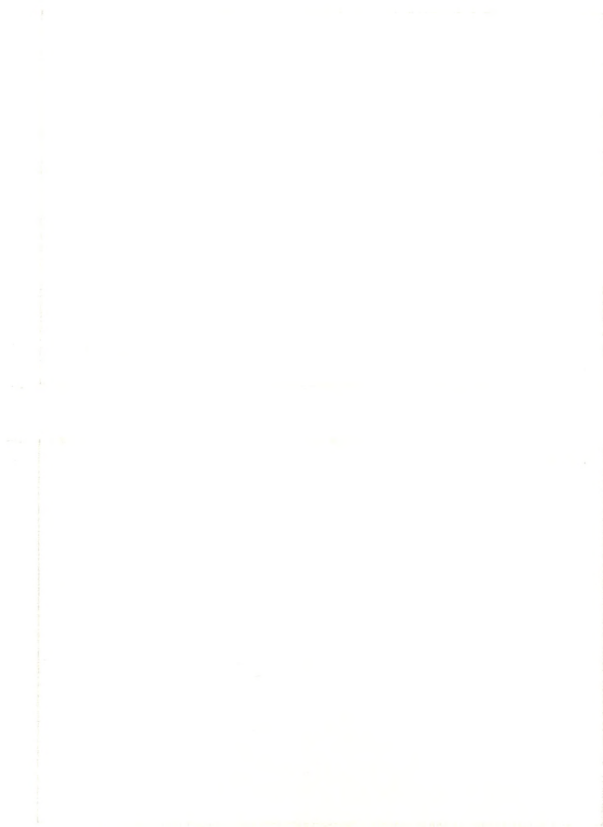


# Without Change There is No Benefit from IS

I- 28

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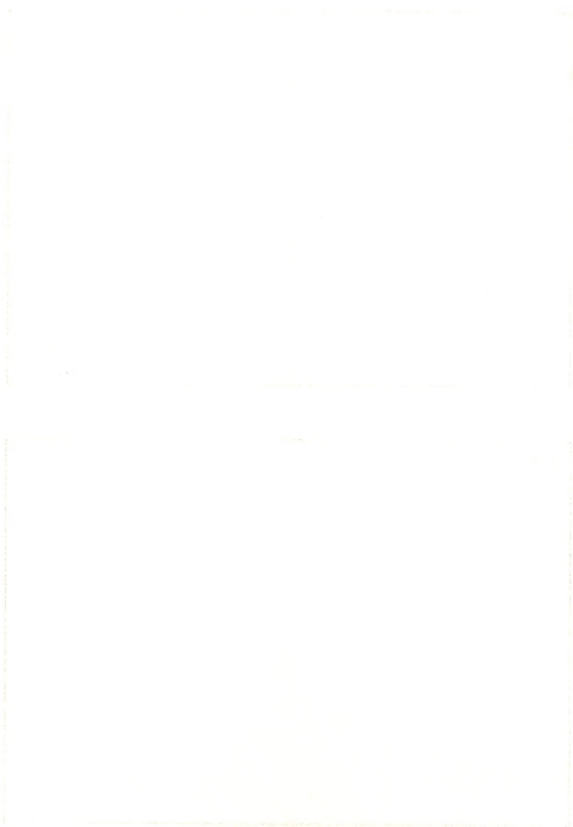
# The Human Element

- Changing systems is a process
- Evolution not revolution

I- 29

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## Concerns

- Ergonomics
- Health
- Deskilling
- Organization
- Redundance
- Progress

I-30

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Notes



## CIM—The Human Element

- U.S.
  - Technology as a fix
- Japan
  - Technology plus people

I- 31

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# Corporate Organization

- IT and IS will change the organization
- How will it operate?
- People
  - How many?
  - When?
  - What skills?

I- 32

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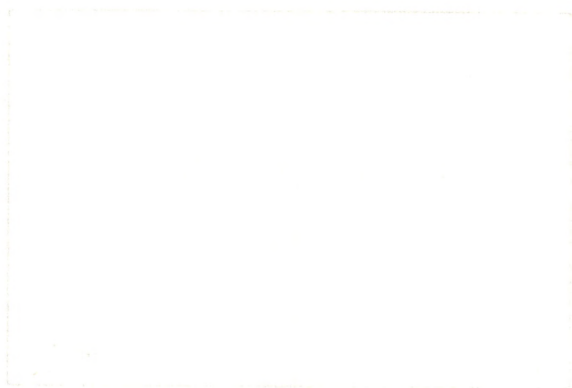


# V.P. Humatics

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## Key Future Trends—Impact on IS

Trend	Impact on IS
Business integration— within companies	Centralization of infrastructure planning
Business integration— between companies	
Decentralization of technology	

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Notes



## Key Future Trends—Impact on IS

Trend	Impact on IS
Increasing use of communications	Network view of the corporation
Emphasis on business planning	Decreased involvement in operations

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Notes



# Industry Structure Model

- Information-oriented
- Service-oriented
- Product-oriented

I-36

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Notes





## Information-Oriented

- Heavy involvement in enterprise planning
- Strong technology strategy
- Mixed systems development roles
- Strong core operations

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Notes



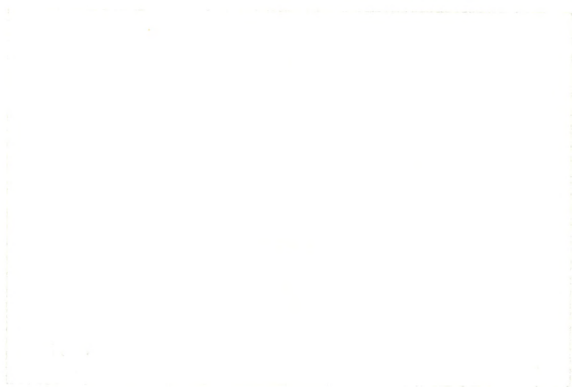
## Service-Oriented

- Varied involvement in enterprise planning
- Mixed technology strategy
- Centralized systems development roles
- Strong core operations

I- 38

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Notes



## Product-Oriented

- Varied involvement in enterprise planning
- Varied technology strategy
- Varied systems development roles
- Varied core operations

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Notes



## Evolution of CIO Role

- Role will not disappear
- Same objectives/problems
- More focus on strategy/planning
- Less focus on systems development/operations
- Stronger focus on telecom/network

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Notes





## Information Systems Executive Role in the 1990s



An Internal "Systems Integrator"

I- 41

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Notes



# IS Organization in the 1990s

Not Centralized

Not Decentralized

Federated

Brought together "by agreement of each party to sublimate its power to the central authority in common affairs." - Webster

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Notes



## Federated IS Organization

Federal Government	Corporate <u>IS</u>
Defense	Competition
Treaties	Partnerships
Regulation	Standards
National programs	Corporate systems
National policies	Corporate policies

INPUT

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Notes



## Federated IS Organization

State Government	Unit <u>IS</u>
Citizens	Customers
Local issues	Business support
Operating programs	Operating systems
Policy implementation	Policy implementation

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I- 44

Notes





## Corporate Information Systems Organization Style

- Smaller
- Expert based—technology and business
- Consulting style—information engineers and solution builders
- Marketeers for technology

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Notes



## IS Responsibilities—1990s

- Treat "users" as customers
- Analyze "make" or "buy" decisions
- Consult on strategy and direction

I- 46

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Notes



## IS Responsibilities—1990s

- Support organizational units at all levels in use of:
  - Information
  - Information systems and services
  - Information technology

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I-47

Notes



# Communications

- Executives
- Customers (users)
- Staff

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I-48

Notes





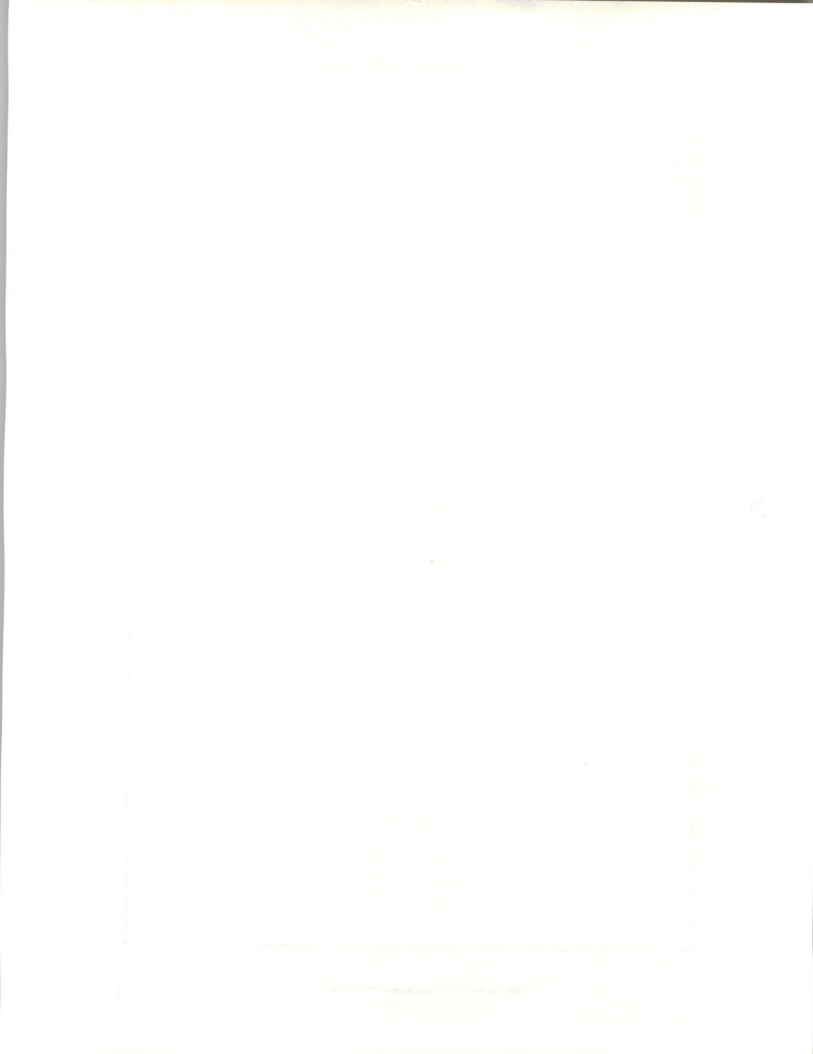
# Information Systems Technology Trends

- Integrated data bases (relational)
- Platform independence/systems connectivity
- CASE technologies
- Expert systems
- On-line transaction processing capabilities

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## Impacts

- Looking outside for solutions
- Buying process changing
  - Users
  - IS management
  - Corporate management
  - Finance
  - Partnerships with vendors

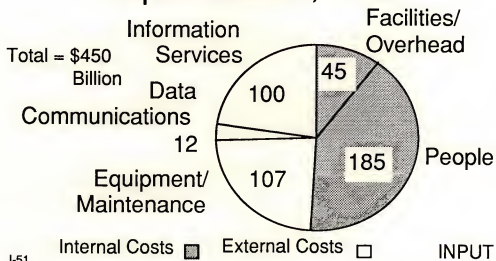
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I-50

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# U.S. Information Systems Expenditures, 1990

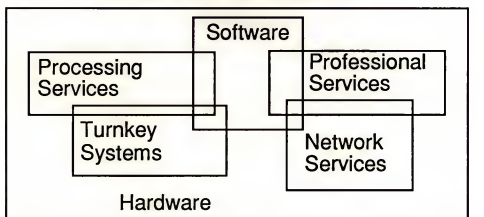


Notes



# IS Market Structure—1980s

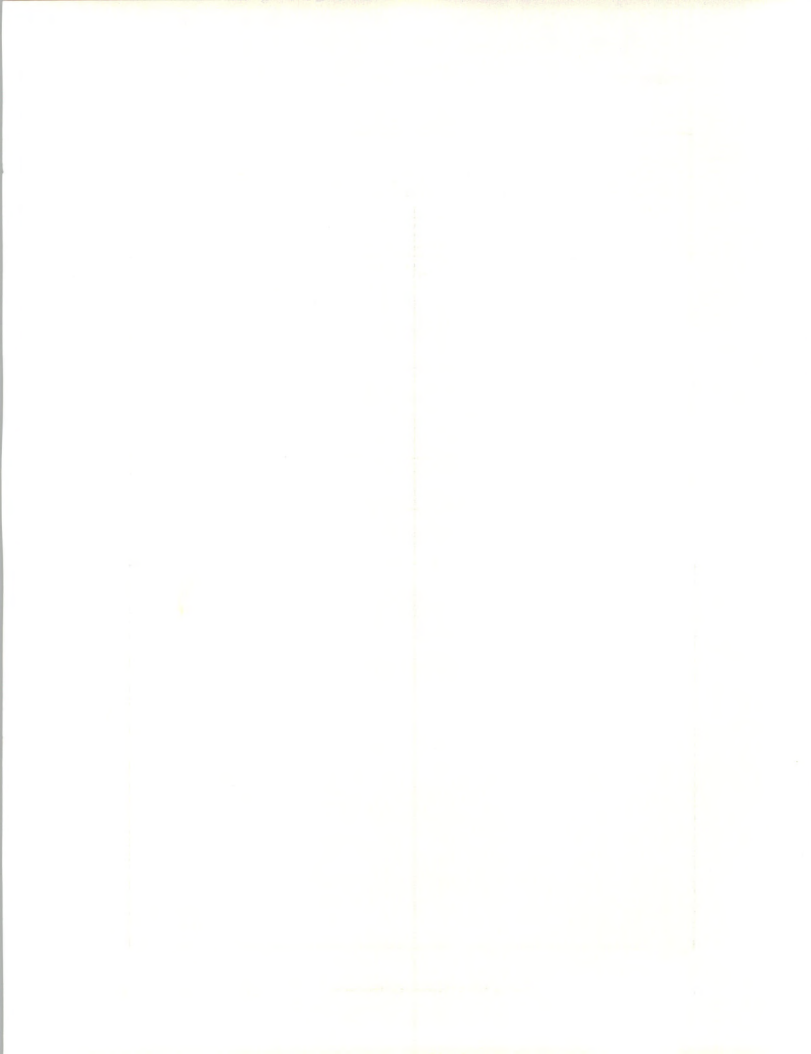
## *INPUT's View*



I-52

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Notes





## Key Trends for the 1990s

- Changing market channels
- Internationalization of offerings
- Standards a growing influence
- Vendor consolidation
- Professional services—"the glue"

I-53

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Notes



# Information Systems Budget Impact of Economic Slowdown

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## 4th Quarter 1990

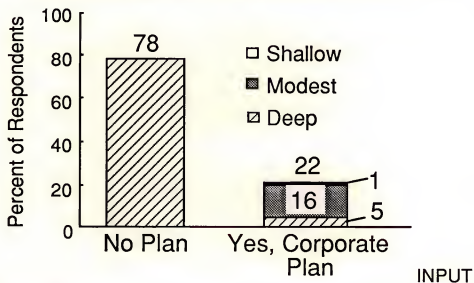
I-54

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## Planning for a Recession

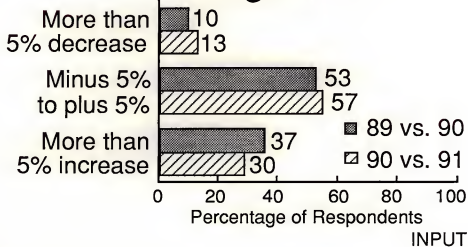


I-55

Notes



## Information Systems Budgets



I-56

Notes





## Current Spending Restrictions Organization-Wide, 1990

- 54% have restrictions in place now
- Of those with restrictions:
  - 42% closely monitor all expenses
  - 31% limit or have frozen hiring
  - 21% limit or have frozen capital spending

I-57

INPUT

Notes



## 1991 Spending Restrictions Organization-Wide

- 58% plan for restrictions in 1991
  - Only 4% above those with 1990 restrictions

I-58

INPUT

Notes

1/14/91



## 1991 Spending Restrictions Organization-Wide

- For the 4%, plans include:
  - Across-the-board cuts
  - Staff reductions
  - Reducing new development

I-59

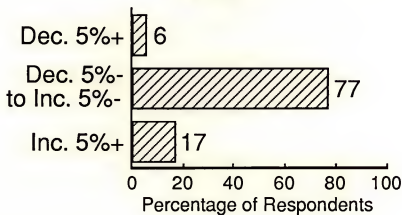
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## IS Budget, 1990 vs. 1991 Staff



I-60

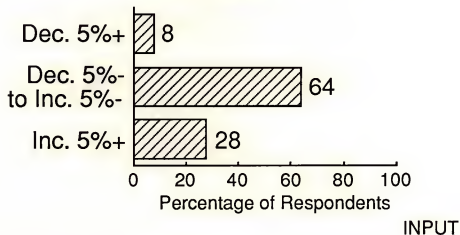
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Notes





## IS Budget, 1990 vs. 1991 Hardware



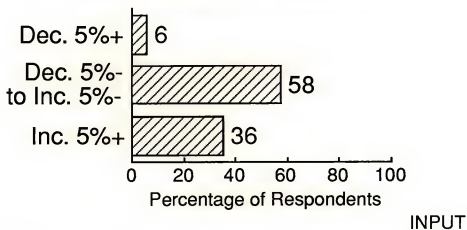
I-61

Notes

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## IS Budget, 1990 vs. 1991 Software Products

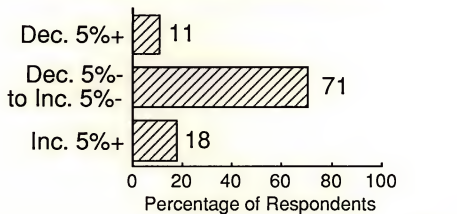


I-62

Notes



## IS Budget, 1990 vs. 1991 Telecommunications

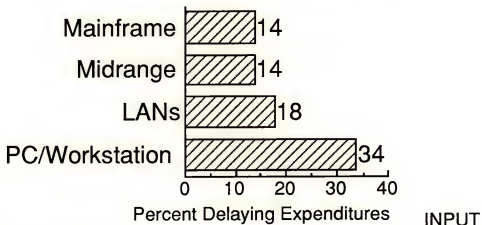


I-64

Notes



## 1991 Economic Impacts on Hardware Spending



I-65

Notes





# Systems Downsizing

- 52% implementing downsizing
- 20% planning or considering

I-66a

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Notes



## Recessionary Impacts

- Recessionary impacts
  - 53% no impact
  - 39% would increase spending
  - 8% would slow

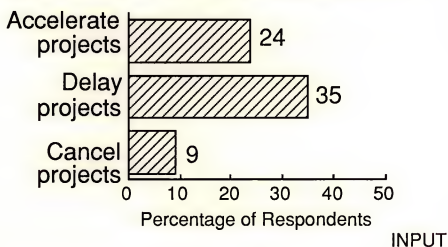
I-66b

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Notes



## Recessionary Impacts on Application Development



I-67

Notes

1/14/91



## Recessionary Impacts on Information Services

- Question: "If moderate recession, what impacts?"
- Consulting
  - 42%—Spending down more than 10%
  - 39%—Spending unchanged

INPUT

I-68

Notes





## Recessionary Impacts on Information Services

- Systems Development
  - 41%—Spending down more than 10%
  - 27%—Spending unchanged

I-69

INPUT

Notes

1/14/91



## Recessionary Impacts on Information Services

- Processing Services
  - 59%—Spending unchanged
  - 33%—Increase spending more than 10%

I-70

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Notes

1/14/91



## Recessionary Impacts on Information Services

- Systems Integration
  - 29%—Spending down more than 10%
  - 47%—Spending unchanged

I-71

INPUT

Notes



## Recessionary Impacts on Information Services

- Systems Operations (Outsourcing)
  - 50%—Spending unchanged
  - 33%—Increase spending more than 10%

I-72

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Notes

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## 1991 Spending—Impacts Have Begun

Market Sector	1991 Budget	Recession Spending
Wholesale distribution	n/c	-
Retail distribution	n/c	-
Discrete manufacturing	+	-

+ = Budget/spending up

n/c = No change

- = Budget/spending down

INPUT

I-73

Notes



## 1991 Spending—Impacts Have Begun

Market Sector	1991 Budget	Recession Spending
Process manufacturing	+	-
Federal government	nc	-

+ = Budget/spending up

n/c = No change

- = Budget/spending down

INPUT

I-74

Notes



## 1991 Spending—Impacts Probable

Market Sector	1991 Budget	Recession Spending
Transportation	+	-
Banking and finance	+	-
State & local government	+	-

+ = Budget/spending up      n/c = No change

- = Budget/spending down

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Notes



## 1991 Spending—Minimal Impacts Expected

Market Sector	1991 Budget	Recession Spending
Insurance	+	+
Medical/health care	+	+
Business/consumer svcs.	+	n/c

+ = Budget/spending up      n/c = No change

- = Budget/spending down

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I-76

Notes





## 1991 Spending—Minimal Impacts Expected

Market Sector	1991 Budget	Recession Spending
Utilities	n/c	n/c
Telecommunications	n/c	n/c
Education	+	n/c

+ = Budget/spending up

n/c = No change

- = Budget/spending down

INPUT

I-77

Notes



## Users: Recession-Related Topics

- Recession vs. current restrictions
- Negotiating and trade-offs
- Speeding vs. slowing development
- Inside vs. outside development
- Inside vs. outside systems operations

I-78

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Notes



## Vendors: Recession-Related Topics

- Vendor vs. user spending restrictions
- Implications of user downsizing
- Inside vs. outside development
- Inside vs. outside systems operations
- Sector-by-sector questions

I-79

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Notes



# Information Technology Implementation Trends

I-80

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Notes





## Information Technologies Surveyed

- Image processing
- Cooperative processing
- CASE
- Distributed DBMS
- Object-oriented programming

I-82

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Notes



# Information Technologies Surveyed

- LANS,WANS, MANS
- Open systems
- SAA
- UNIX
- Data center management

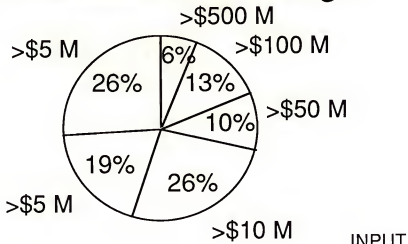
I-83

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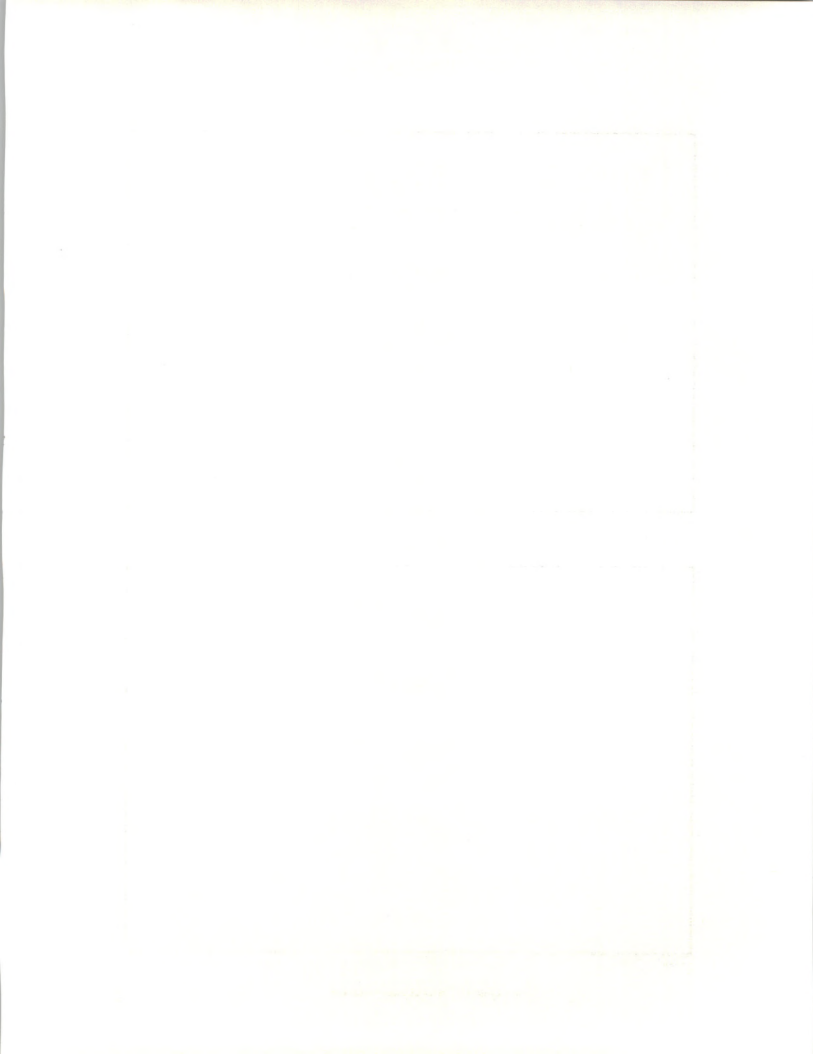


## Information Technology Trends Distribution of IS Budget

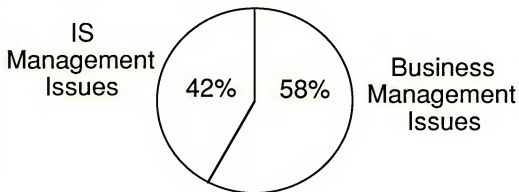


I-84

Notes



# Technology Implementation IS vs. Business Inhibitors



I-85

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Notes





# Technology Implementation Business Mgmt. Inhibitors

Rank	Percent of Respondents	Inhibitors
1	41	Business need
2	19	Business interruption
3	15	Budget
4	10	Cost/benefit
5	9	Startup cost

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Notes



## Technology Implementation IS Mgmt. Inhibitors

Rank	Percent of Respondents	Inhibitors
1	22	Staff availability
2	21	Existing systems
3	19	Integration
4	14	Training
5	12	Resistance to change

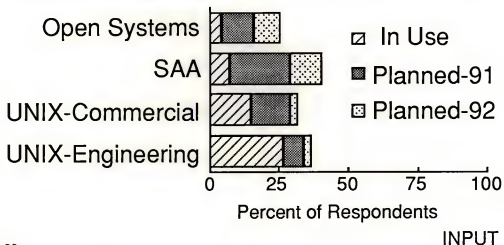
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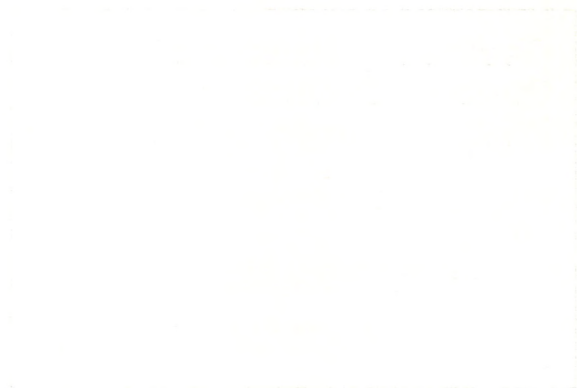


## Technology Status and Timing Operating Systems/Architecture

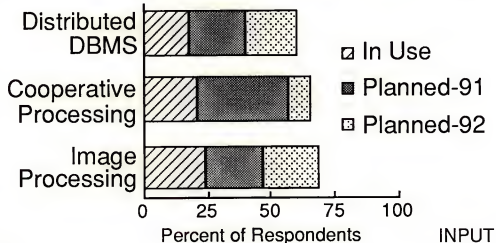


I-88

Notes



## Technology Status and Timing Operating Systems/Architecture



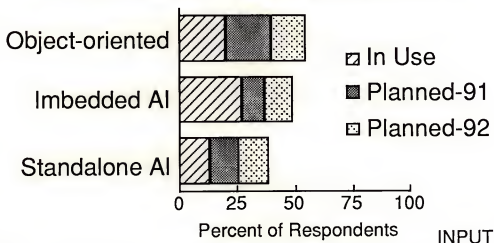
I-89

Notes





## Technology Status and Timing Application Development

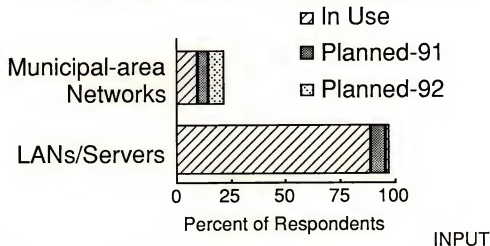


I-91

Notes



## Technology Status and Timing Networks/Communications

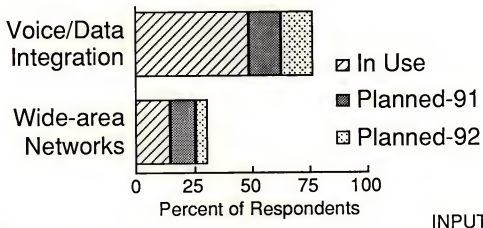


I-92

Notes



## Technology Status and Timing Networks/Communications

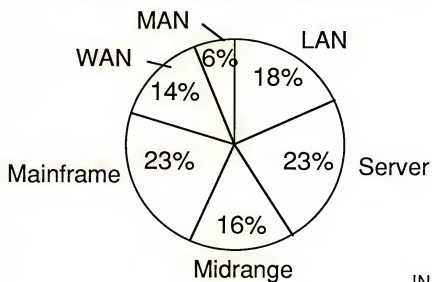


I-93

Notes



# LAN Interconnections



I-94

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Notes





## LAN Use—Active Central Applications

Application	% Act. 1990	% to be Act.—1992
Accounting	45	60
Executive Info Sys	27	65
Mainframe DBS	40	72
Queries		

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Notes



## LAN Use—Active Central Applications

Application	% Act. 1990	% to be Act.—1992
Production	16	36
Scheduling		
Sales Reporting	23	38
Order Entry	23	37

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Notes



## LAN Use—Active PC Applications

Application	% Act. 1990	% to be Act.—1992
Electronic Mail	52	75
Desktop Publishing	55	68
PC Tools	84	90

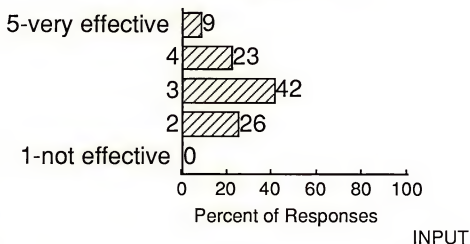
I-97

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Notes



## Effectiveness of LAN Interconnections



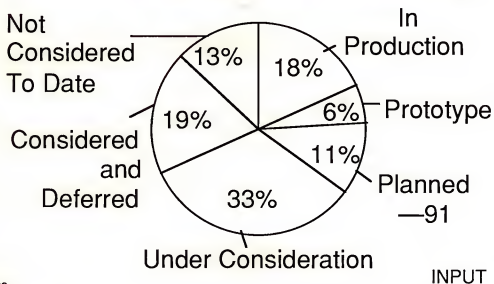
I-98

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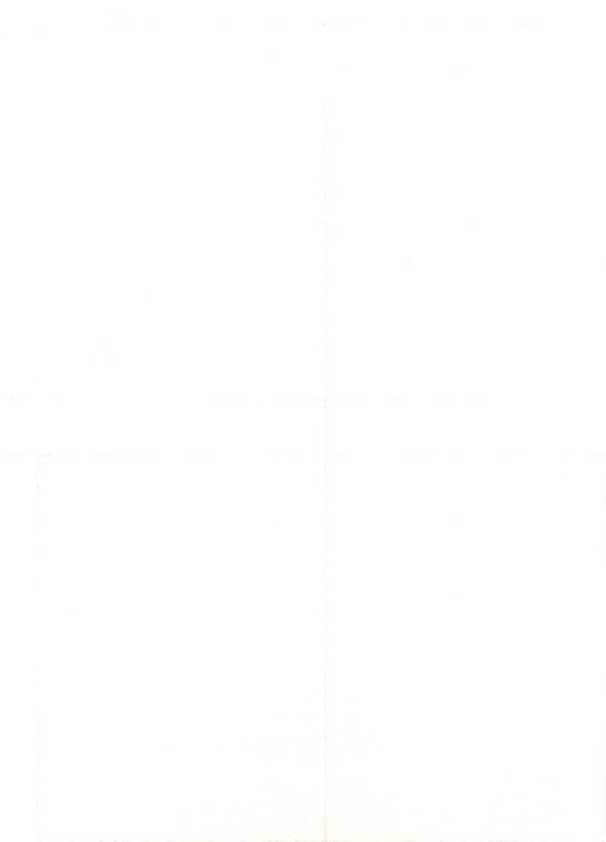


## Status of Image Processing



I-99

Notes



## Image Processing in Use by Industry

Industry	In Use (Percent)	Planning (Percent)
Insurance	20	8
Transportation	20	12
Discrete Mfg	15	18
Process Mfg	10	23

I-100

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Notes



## Image Processing in Use by Industry

- Others
  - Education
  - Telecommunications
  - Wholesale Distribution

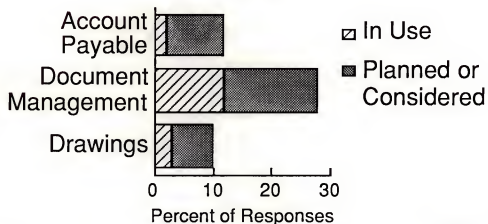
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Notes



# Image Processing Applications



I-102

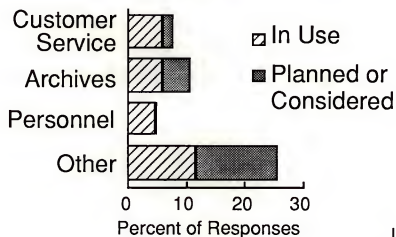
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## Image Processing Applications



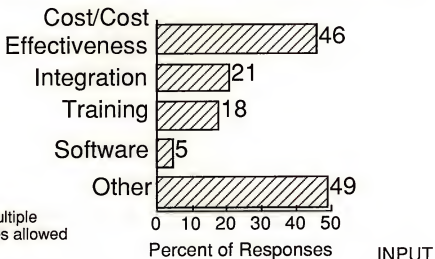
I-103

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## Issues for Image Processing

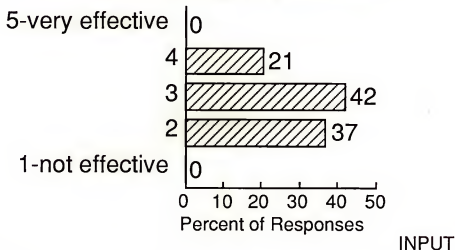


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## Effectiveness of Image Processing Systems

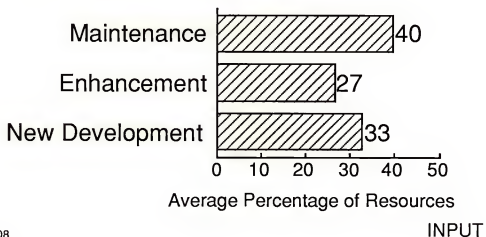


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Notes



## Allocation of Development Resources



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Notes





## Controlling Application Maintenance Resources

	% Using
Limited resource allocation	71
Purchased software replacement	43
Re-engineering of applications	38
	INPUT

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Notes



## Controlling Application Maintenance Resources

	% Using
Maintenance only function	34
Contract out	22
Assign to user	18
Recode	13

I-110

INPUT

Notes



## Controlling Application Maintenance Resources

	Effectiveness*
Re-engineering of applications	3.1
Maintenance only function	2.8
Purchase of software replacement	2.7

\* 1 = not effective, 5 = very effective

INPUT

I-111

Notes



## Controlling Application Maintenance Resources

	Effectiveness*
Recode	2.7
Limited resource allocation	2.7
Contract out	2.7
Assign to user	2.6

\* 1 = not effective, 5 = very effective

INPUT

I-112

Notes





## CASE Activity by Industry

Industry	% Using	% Considering
Discrete Mfg.	18	12
Process Mfg.	14	32
Utilities	11	-
Telecommunications	11	4
Insurance	9	12
Transportation	9	16

I-113

INPUT

Notes



## Issues in Using CASE

Issue	Using	Considering
Staff acceptance	✓✓✓	✓✓
Cost/training	✓✓✓	✓
Integration	✓✓	✓✓
Planning	✓✓	✓
Proven results	✓	✓
Methodology	✓	✓

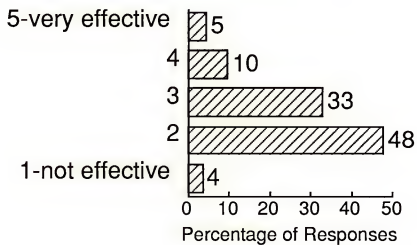
I-114

INPUT

Notes



## Effectiveness of CASE



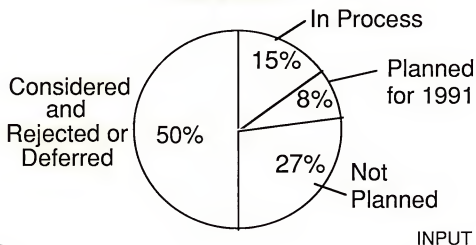
I-115

INPUT

Notes



## Consolidation of Data Centers



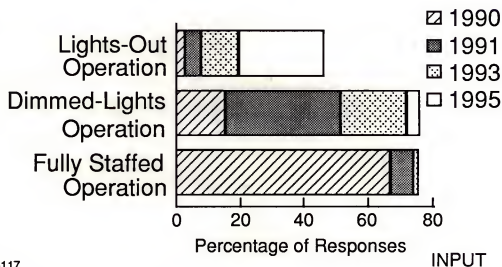
I-116

Notes





## Data Center Objectives

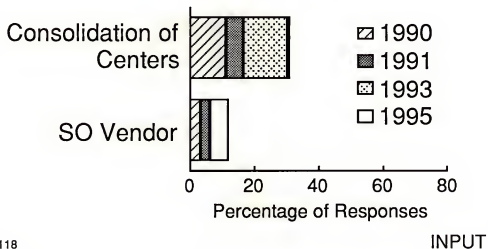


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Notes



## Data Center Objectives



I-118

Notes



## Information Technology Trends Observations

- Inhibitors differ between IS and top management
- Technologies apparent to top management adopted faster
- Learning curves remain—witness image processing and CASE

I-119

INPUT

Notes



## Information Technology Trends Observations

- Data center management area of focus
- Overall effectiveness satisfactory at best

I-120

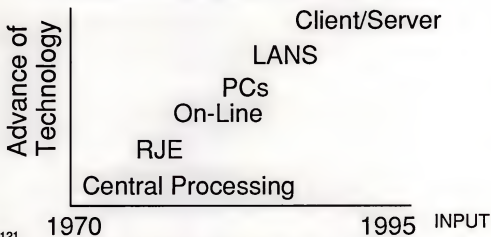
INPUT

Notes





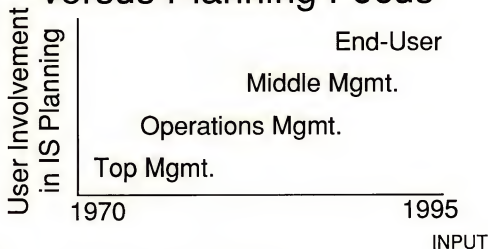
## Advance of Technology versus Planning Focus



Notes



# Advance of Technology versus Planning Focus



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Notes

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# 1991 Issues

- IT justification
- Impact of the economy

I-123

INPUT

Notes



# Revolutions

- Downsizing
- Outsourcing
- Networking

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INPUT

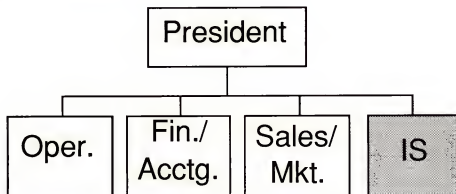
Notes





IS Function

## Information Systems View



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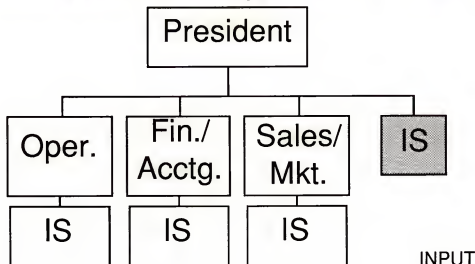
INPUT

Notes



IS Function

## General Management View



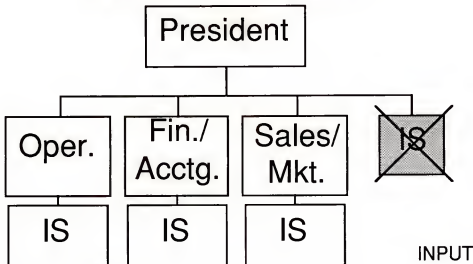
I-127

Notes



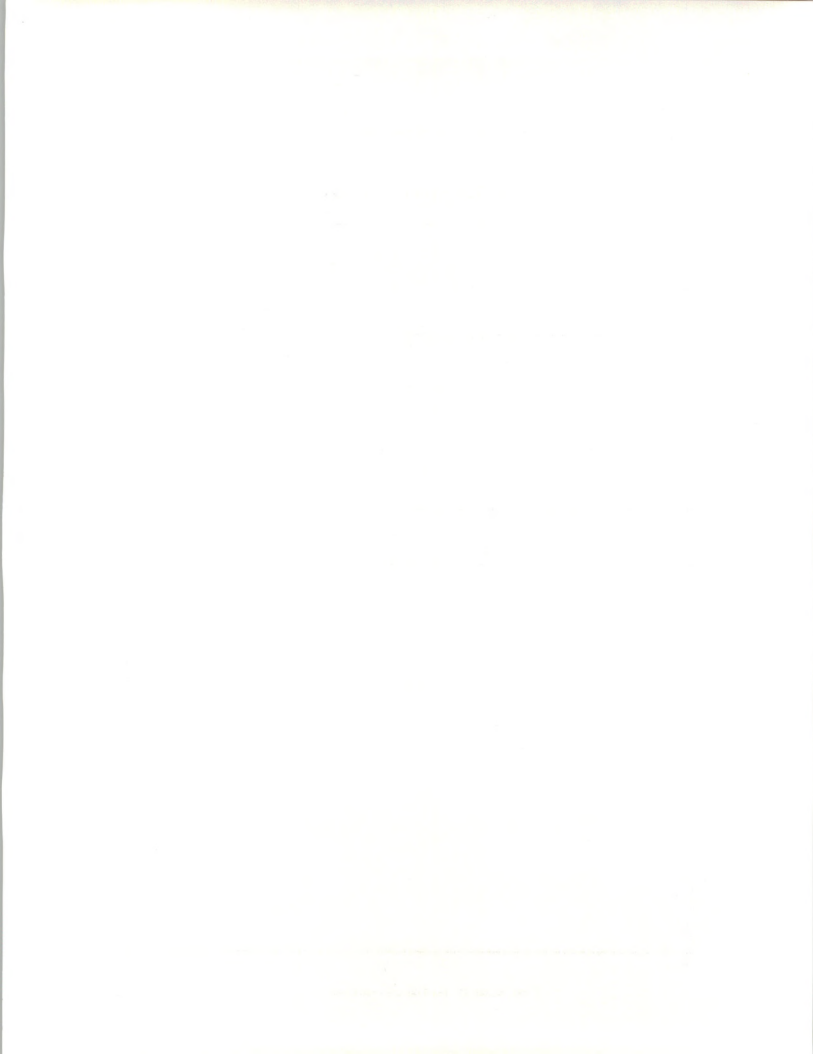
IS Function

## The View in 2001



I-128

Notes



## Question

What thresholds are crossed  
with technology improvement?

I-129

INPUT

Notes

